

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method of registering a ~~first~~ floating image and a ~~second~~ reference image, the method comprising the steps of:

selecting, by an image processing device, at least one first landmark in the ~~first~~ floating image;

selecting, by ~~[[an]]~~ the image processing device, at least one second landmark in the ~~second~~ reference image, wherein the at least one first landmark corresponds to the at least one second landmark; and

registering, by ~~[[an]]~~ the image processing device, the ~~first~~ floating and ~~second~~ reference images by using a similarity value which relates to a similarity of a first region in the ~~first~~ floating image determined by the at least one first landmark and a second region in the ~~second~~ reference image determined by the at least one second landmark, the registering including selecting at least one further first landmark in the ~~first~~ floating image and at least one further second landmark in the ~~second~~ reference image if the similarity value is less than a pre-selected value.

2. (Currently Amended) A method of registering a ~~first~~ floating image and a ~~second~~ reference image, the method comprising the steps of:

selecting, by an image processing device, at least one first landmark in the ~~first~~ floating image;

selecting, by ~~[[an]]~~ the image processing device, at least one second landmark in the ~~second~~ reference image, wherein the at least one first landmark corresponds to the at least one second landmark; and

registering, by ~~[[an]]~~ the image processing device, the ~~first~~ floating and ~~second~~ reference images by using a similarity value which relates to a similarity of a first region in the ~~first~~ floating image determined by the at least one first landmark and a second region in the ~~second~~ reference image determined by the at least one second landmark, the registering including selecting at least one further first landmark in the ~~first~~ floating image and at least one further

second landmark in the second reference image as a function of a pre-selected value of the similarity value,

wherein, for the first floating image having a first number of dimensions, a second number of first landmarks is selected; wherein, for the second reference image having the first number of dimensions, a third number of second landmarks is selected; wherein the second number of first landmarks determine first vertices of first simplices for determining a fourth number of regions in the first floating image; wherein the third number of second landmarks determine second vertices of second simplices for determining the fourth number of regions in the second reference image; wherein the second number is the first number plus one; wherein the first and second landmarks are selected in accordance with a qualifying function; and wherein the third number is equal to the second number.

3. (Currently Amended) The method of claim 2, wherein, for each of the second number of second landmarks, the local deformation field is determined for determining a first global deformation field which approximately describes a deformation required to the first floating image for registration onto the second reference image.

4. (Currently Amended) The method of claim 3, wherein, for each of the fourth number of regions in the first floating image, a first similarity value is determined relating to a similarity between a respective one of the regions in the first floating image to a respective corresponding one of the regions in the second reference image by using the first global deformation field.

5. (Currently Amended) The method of claim 4, wherein it is determined whether there is a fifth region of the regions in the first floating image in which the first similarity value is less than a preset threshold value; wherein, when there is a fifth region, a third landmark is selected in the fifth region for determining third simplices in the fifth region which determine a plurality of sixth regions; wherein, when there is a fifth region, a fourth landmark is selected in a seventh region of the regions in the second reference image for determining fourth simplices in the seventh region which determine a plurality of eighth regions; wherein the third landmark corresponds to the fourth landmark such that the sixth regions correspond to the eighth regions; wherein, for each of the sixth regions, a second similarity value is determined relating to a

similarity between a respective one of the sixth regions to a respective one of the eighth regions by using a second global deformation field which has been refined by using a further local deformation field of the third landmark.

6. (Original) The method of claim 5, wherein the method is iteratively repeated until all similarities exceed the preset threshold value.

7. (Original) The method of claim 1, wherein the method is applied in medical imaging to one of CT data sets, MRI data sets, PET data sets, SPECT data sets, and ultrasonic imaging data sets.

8. (Currently Amended) Image processing device, comprising:

a memory for storing a first floating image and a second reference image; and
an image processor for registering the first floating image and the second reference image.

wherein the image processor is adapted to perform the following operation:

selecting at least one first landmark in the first floating image;
selecting at least one second landmark in the second reference image, wherein the at least one first landmark corresponds to the at least one second landmark; and
registering the first floating and second reference images by using a similarity value which relates to a similarity of a first region in the first floating image determined by the at least one first landmark and a second region in the second reference image determined by the at least one second landmark, the registering including selecting at least one further first landmark in the first floating image and at least one further second landmark in the second reference image if the similarity value is less than a pre-selected value.

9. (Currently Amended) Computer program on a computer-readable device for registering a first floating image and a second reference image, wherein the computer program causes a processor to perform the following operation when the computer program is executed on the processor:

selecting at least one first landmark in the first floating image;

selecting at least one second landmark in the ~~second~~ reference image, wherein the at least one first landmark corresponds to the at least one second landmark; and

registering the first floating and ~~second~~ reference images by using a similarity value which relates to a similarity of a first region in the first floating image determined by the at least one first landmark and a second region in the ~~second~~ reference image determined by the at least one second landmark, the registering including selecting at least one further first landmark in the first floating image and at least one further second landmark in the ~~second~~ reference image if the similarity value is less than a pre-selected value.

10. (Currently Amended) The method of claim 1, wherein the selecting the at least one further first landmark in the first floating image and the at least one further second landmark in the ~~second~~ reference image is based on the similarity value not exceeding the pre-selected value.